Synopsis of the Research Topic

Entitled

‘Breeding Ecology and phenology of Indian Silver-bill Munia (*Euodice malabarica*) in Nanded district of Maharashtra’

Submitted for the

Registration to Ph. D. Degree in subject Zoology

Under
The Faculty of Science and Technology

of

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1) A brief resume of proposed work / Problem :

Indian Silver bill munia is one of the most commonly found birds in India and neighboring countries. According to recent reports this bird species has become well adapted for urban city life of many of the cities (including metropolitan cities such as Mumbai, Delhi etc.) Despite of being common, there is huge research gap has come forth after referring to available literature. To learn more about this bird detailed study is needed through which we will be able to draw conclusions about current status of the Indian silverbill population. Research problem also be dealing with some of the remarkable mating behavioral pattern of Indian Silverbill Munia. This study is aimed to find out breeding ecology and phenology of Indian Silverbill Munia, which may be currently playing a vital part of the urban ecosystem and might come forth as an important crop pest of Nanded district.

2) Introduction to proposed research topic :

Birds and animals adapt themselves with the drastically changing environment to survive. Animals can actively influence the selection they experience.(Kevin 2010) Organisms are sometimes portrayed as passive participants in evolutionary processes, subject to sorting and filtering by their environment, thus, the selection they experience (Lewontin 1978; Odling- Smee et. al., 1996; Laland et. al., 1999).

Indian Silverbill munia *(Euodice malabarica)* have been observed mating multiple times in a single day. Mating frequency has been observed with remarkable mating dance and mating rituals have been observed in some of the individuals. Mating frequencies in passerine birds could be for ensuring fertilization (Birkhead et.al (1987) and Birkhead (1988) however concluded that there is a little evidences (Petrie, 1992).

Since Indian Silverbill are mostly monogamous in nature and the bond between the mates and other individuals of the group has been seen quite strong. The Indian Silverbill munia is widespread resident, except in North West and North East parts of India, but not found in Himalayas and other colder regions. In those species where males provides parental care repeated copulation my increase the paternity confidence of the female's mate; that may more likely to invest in the offspring. (Burke et. al., 1989).

Indian silverbill munia is also known as White throated munia and can be commonly seen in the villages, city outskirts and well urban areas of Nanded and has been reported in Godavari river basin. (Chavan et al., 2015). The same bird has been reported as the least concern bird of the semi-arid landscape a study from Chitradurg district, Karnataka State. (Sv, 2018) Indian Silverbill is introduced species through cage escapes that now breed at several areas in the wild. (Ehab Eid et. al., 2011). In many passerine birds the nest building is associated with the female's fertile period and copulation occurs even before and after nest building.(Birkhead et al., 1987) Even though the population of Indian Silverbill munia is quite common in most of the cities but there has been an alarming reports published in The Hindu Newspaper, from Delhi sub-urban areas by a bird watcher, indicates, it is really surprising the decline in number of individuals, which used to spot more often few years back.

3) Survey or review of the literature and Development in the relevant subject:

Indian silverbill (*Euodice malabarica)* (Linnaeus, 1758) is a forest bird, has been found to adapt itself in urban environments in number of cities in India. Indian Silverbill is a small passerine bird found in Indian subcontinent and adjoining regions such as Nepal, Pakistan, Bangladesh, Yemen, etc. which has white rump and upper tail covert. It is also known as White Throated Munia (Ali Salim 1964). Formerly considered too closely related to the African Silverbill *(Lonchura canrans)* (WWW.avibase.com). Indian Silverbill, construct relatively large , dome shaped nest of grasses with an entrance on one side besides this they have been observed constructing cup shaped nest for laying eggs and for the temporary resting. Archer and Godman (1961) described one nest as being composed of upper stems of seedling grass about six inches in length with a bedding of white flake like seeds and a few white feathers. The Indian Silverbill munia is widespread resident, except in North West and North East parts of India, but not found in Himalayas and other colder regions. Male has fawn-brown upper parts, whitish face and under parts with barred flanks, long and pointed black tail and white rump and upper tail-coverts. Female is duller with plainer face, and flanks, are less barred. Juvenile lacks barring on flanks, has dark mottling on rump and tail is shorter and more rounded. Contact call is tchrip! Or tchreep! Flight call is repeated chirr-rup! Song is a series of

short, abrupt trills. It is commonly seen in dry cultivations, grassland and thorny bushes. Formerly placed in *Lonchura.* Indian Silverbill munia is also reported in mining environment of kachchh, Gujarat (Gajera et al., 2013). The warbling silverbill *(Lonchura malabarica)* which is quite similar in morphology with the Indian silverbill (*Euodice malabarica)* a new nesting bird in Hawaii (Andrew J. Berger,1975). Andrew J. Berger (1975) that there are two races of warbling silverbill (*Euodice malabarica cantans)* and *(L.m orientalis)* which are native to Africa. (Andrew J. Berger, 1975).

From the literature review, it was conclude that, detailed study has not been done on this particular bird species i.e Indian silverbill munia (*Euodice malabarica).* As per the observation till now this bird plays an important role in the urban ecosystems along with the agricultural ecosystem. This bird may act as an important crop pest and may be harmful for the crop yield, if left unnoticed, may be serious threat for the agriculture in future.

The Indian silverbill live in small flocks and there are several predators for this species such as, Shikra *(Accipiter badius)*, Brahminy kite (*Haliastur indus)*, Black kite *(Malvus migrans)* , Black Winged Kite *(Elanus caerueus)* the eggs of Indian Silverbill are one of the main portion of the diet of snakes such as Indian Rat snake *(Ptyas mucosa)* , Indian spectacled Cobra *(Naja naja)*, Cat snake *(Boiga trigunata)*, Indian Vine Snake *(Ahaetulla nasusta)* , Bronzeback tree Snake *(Dendrelaphis tristis)* etc. This suggests that the healthy population of this bird is so much important to maintain ecosystem and food chain in semi-urban and agro based regions.

Indian silverbill munia (*Euodice malabarica)* mainly feed on the grass seeds and small grains, and is a good vector for the seed dispersal of wild grasses and grain bearing plants, It makes them an important passerine species in order to rejuvenate and sustain grassland ecosystems and food chain in the ecosystem. The Indian silverbill Munia is abundantly found in Nanded city and outskirt areas of Nanded district of Maharashtra. (Shivaji Prabhakar Chavan, 2018)

4) Objectives of research and proposed hypothesis:

1) To determine the population indices, occurrence, status of Indian Silverbill.
2) To study of breeding aspects of Silverbill in the selected study area.

Breeding Ecology: Pair selection, Courtship, Mating, habitat selection by Indian Silverbill.

Nesting: Nest Ecology, Construction of nest (material) , micro climate, of Indian Silverbill. Selection for nesting and mating behaviors of Indian Silverbill.

3) To determine the breeding phenology of Indian Silverbill: Clutch size, Incubation period, hatching success, feeding, fledging success.
4) To evaluate behavioral studies of Indian Silverbill: Colonial breeding, Mate selection, signaling. To determine ecological role of Indian Silverbill :
5) To find out current role of Indian Silverbill in agriculture and urban ecosystem of study area.

5) Methodology to be used and adopted.

- Filed observations.
    - Spot mapping- to know the species composition of the area.
    - Species checklist.
    - Nest searching: to determine reproductive success rate.
    - Behavioral observations: to observe bird/ habitat relation and bird response to surrounding factors.
    - Area search:
- Line transact methodology.
- Point count : to monitor breeding birds during breeding season.
- Complete census method: to estimate reproductive success
- Population indices with statistical data handling methods.
- Field observations: direct observations with help of Telephoto lenses and DSLR with good magnifications, Binoculars, Track camera, Go-pro.
- Capture mark recapture (if required)

6) Importance of the study

❖ **International status:**

The Indian silver bill is found in India as well as number of different countries like South Africa, Afghanistan, Pakistan and many neighboring countries. Hence this

study may provide a quality data base to know more about this particular bird species. In this way we will be able to draw more stable conclusions in order to conserve the bird species as well as the other related species which are directly indirectly related to Indian silver bill. Despite of wide spread existence very little study has been done on this bird species.

- **National status:**

Indian silver bill munia is wide spread species of passerine bird which is distributed in most of the states (except temperate and colder regions) of India including Maharashtra. The Indian Silverbill Munia is least concerned bird in India as well as neighboring countries which are abundantly found in flocks, prefer dry and arid regions as their breeding and residential sites. This bird is one of the commonly found bird species in India. Indian silver bill Munia is also found in hot regions of the country such as Rajasthan and Sahara desert.

- **Regional status:**

It is surprising to see a forest bird is a nest in comparatively polluted areas if urban environment and city outskirts of the Nanded district area which is selected as research area. The Indian silverbill munia plays an important role in urban and agricultural ecosystems of this region. Indian silver bill munia not only play an important role in the arid forests of the study area but also play an important role in the grassland ecosystems as an important vector for seed dispersal. It has a vital role in the crop field as well as urban life ecosystems of the research area. This bird is under the danger of the smuggling and trafficking since number of cases has been observed in the past few years.

- **Scope of study:**

i) This study may lead to better understanding about ecology, phenology and behavioral patterns of Indian silverbill munia.

ii) Outcome of this research may give a comprehensive idea about role of Indian silverbill munia in an ecosystem and food chain of the research area.

iii) Research may be useful as a database for information of Indian silverbill munia bird and their phonological, ecological and behavioral aspects which

may be helpful for better understandings of avian fauna of the research area.

7) Proposed work plan- with tentative Chapter scheme:

i. **Chapter 1**: General Introduction.
ii. **Chapter 2:** Review of Literature
iii. **Chapter 3:** materials and methods
iv. **Chapter 4:** Data collection
v. **Chapter 5**: discussion
vi. **Chapter 6:** summery and conclusion

8) Year wise plan of work and targets to be achieved :

- **First year :**
  1) Review of literature
  2) Field visits for observations and sampling in the habitats of Indian Silverbill.
  3) Referencing of Work.
  4) Submission of progress report.
  5)
- **Second year :**
  1) Field work and visit to different study places to get the expected readings as per objectives of this study.
  2) Collection and evaluation of data.
  3) Publication of data in reputed journals.
- **Third Year :**
  1) Completion of research work
  2) Statistical studies of collected data
  3) Research publications, the Thesis writing and submission to the University (S.R.T.M.U.N)

9) Expected Outcome

i. The possible outcome of this study may be, we may find how the Indian Silverbill Munia play an important role in maintaining urban and rural ecosystem healthy.

ii. It may found that whether it is one of the agricultural pests that majorly feed on the agricultural field crops and cause reduced yield, that we are facing now a days.

iii. It may be concluded about some of the complex behavioral patterns among individuals of the same species and may be possible to determine meanings their behavior on various signaling patterns.

iv. The finding of this study may be work effectively used in conservation aspects of this species and possibly able to save their niche to keep them sustained in era of drastic ecosystem changes.

v. There are no in depth study reports has been submitted on this species, hence this study may provide authentic database that may help students, researchers to know this particular bird species properly. This study could lead some of the un noticed medicinal propertu

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